

USER MANUAL

UNIDYNGO

48V Power System



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1 Safety Instructions

1.1 Safety Statement

- 1) The inverter, charger, and distribution modules operate under conditions of high temperature and high voltage. The installation, operation, and maintenance must be performed by trained and qualified personnel.
- 2) During installation, operation and maintenance of system modules, all applicable local safety codes and operating procedures must be followed. Failure to do so may result in personal injury or equipment damage. Safety precautions provided in this manual are only intended as a supplement to the local safety regulations.
- 3) The manufacturer assumes no liability for any violation of the general safety operating requirements or for any violation of the safety standards for the design, manufacture and use of the equipment.
- 4) The following symbols are used throughout the manual to indicate potential hazards or important safety instructions.



WARNING: Potential hazards exist and this operation should be carried out with extreme caution!



WARNING: This operation/function is very important for the normal operation of the system, please give it enough attention!

1.2 General Safety Precautions

- 1) Do not expose system equipment to environments containing moisture, fog, snow, dust, or similar contaminants.
- 2) Do not block or cover ventilation ducts, as this may cause the equipment to overheat.
- 3) To prevent fire and electric shock, ensure all cables are in good electrical condition and suitable wire diameter.
- 4) Do not place flammable materials or other items requiring fire protection in the vicinity of the equipment.

1.3 Safety Precautions Related to Battery Operation

1.3.1 Battery System Safety Specification to Meet EMC Reliability Requirements

1.3.2 Safety Precautions for Battery System Use

- 1) Do not expose the battery to open flame, excessive heat, or incineration. Avoid prolonged storage in high-temperature environments.
- 2) Do not reverse the positive and negative terminals of the battery when installing the battery.
- 3) Do not short-circuit the battery by connecting the positive and negative terminals of the battery directly with metal objects (e.g. wires, spanners).
- 4) Do not puncture the battery with sharp objects or strike it with a hammer. Avoid stepping on the battery or exposing it to any severe physical impact.
- 5) Do not disassemble or modify the battery.
- 6) Keep the battery dry. Do not immerse it in water or expose it to moisture.
- 7) Do not use unqualified equipment when charging and discharging, please follow the correct instructions.
- 8) Do not mix batteries from different manufacturers or different types and models as well as old and new batteries.
- 9) Do not put hot, deformed or leaking batteries into the device for charging and discharging.
- 10) Do not continuously discharge the battery to avoid significant loss of capacity.
- 11) Under the requirements of this regulation:
 - Products stored for more than 3 months should be recharged once.
 - Products stored for more than 6 months must undergo a capacity verification test.
 - Products stored for more than 1 year must be re-inspected and confirmed to be qualified before use.

2 System Introduction

The UNIDYNGO system is an integrated power solution that combines control, display, monitoring, and protection, specifically designed for commercial vehicles, converted vehicles, and similar applications. This high-performance vehicle power system is designed to manage the power supply and distribution requirements of the entire vehicle. It features simple operation, compact design, excellent vibration resistance, flexible installation, comprehensive functions, and high reliability.

2.1 System Highlights

2.1.1 Key Functions

- 1) **Versatility and Applicability:** The UNIDYNGO system is designed with flexibility to support both 230Vac household power and 48Vdc outputs. Whether powering household appliances, vehicle-mounted devices, or outdoor activity equipment, the system provides stable and reliable power supply.
- 2) **Easy Installation, Plug-and-Play:** The system features a user-friendly interface design with clear layouts and markings. Users can easily identify each interface and quickly complete the connection process, achieving true plug-and-play functionality.
- 3) **Efficient, Multi-Source Charging:** The UNIDYNGO system supports grid charging, vehicle charging, and solar charging.
- 4) **Comprehensive Human-Machine Interaction:** This system is equipped with a user-friendly and energy-efficient monitor. Once the screen is activated, touch the two translucent dots at the top and the bottom of the knob to perform operations such as turning on/off the DC-DC charger and the inverter. The screen clearly displays the system's operating status, power input/output details, alarm notifications, and various parameters, enabling users to intuitively understand the system's operation.
- 5) **Remote Control via APP:** By connecting to the monitor via Bluetooth using a dedicated mobile APP, users can easily monitor and manage the system for intelligent power management.

- 6) Stability and Reliability:** The system adheres to TBB's high safety and stability standards, incorporating multiple protection mechanisms, including overload protection, short-circuit protection, over-voltage protection, and under-voltage protection. It can detect abnormalities in real time and respond quickly to prevent equipment damage and safety hazards, ensuring continuous system protection.

2.1.2 System Diagram

1. The UNIDYNGO wiring diagram is shown in Figure 2-1, and the system configuration list is shown in Tab 2-1.

UNIDYNGO - 48V

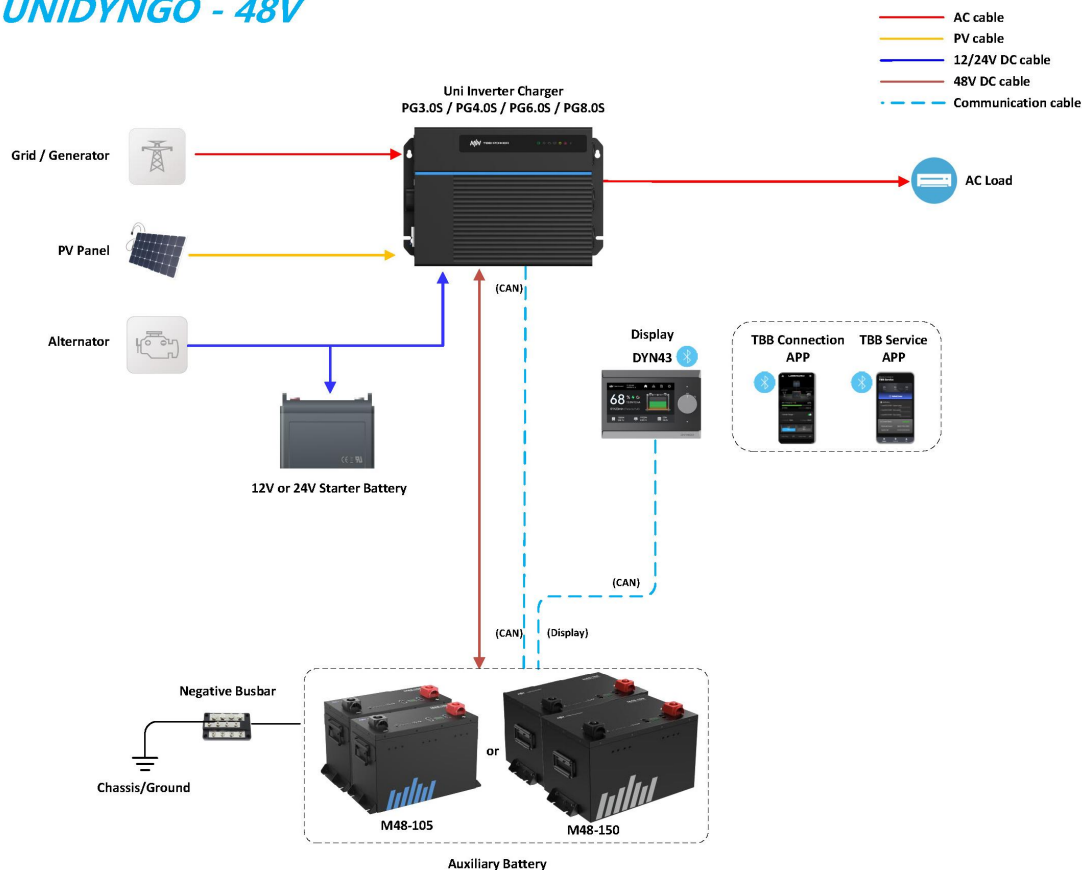


Fig 2- 1 UNIDYNGO System Diagram

Tab 2- 1 System Component

No.	System Component	Note
1	Uni Inverter Charger	PG3.0S / PG4.0S / PG6.0S / PG8.0S
2	Display	DYN43
3	48V Service Battery	M48 Series

2.2 PG Series

The PG series is a new generation high frequency Uni Inverter Charger designed for various mobile power systems: recreational vehicles (RV), utility vehicles, etc.

2.2.1 Product Overview & Dimensions



Fig 2-2 PG4.0S

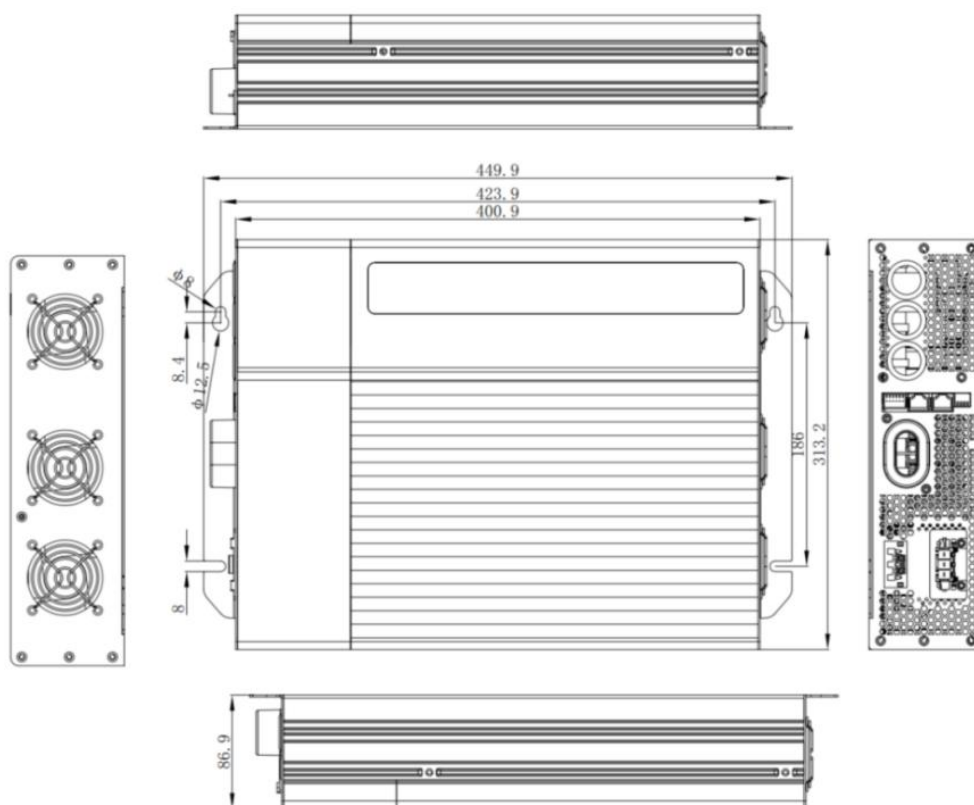


Fig 2-3 Dimensions of PG4.0S

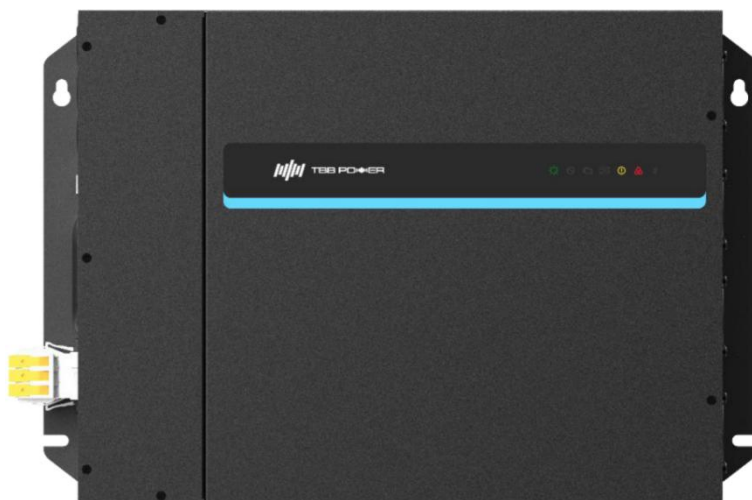


Fig 2-4 PG6.0S / PG8.0S

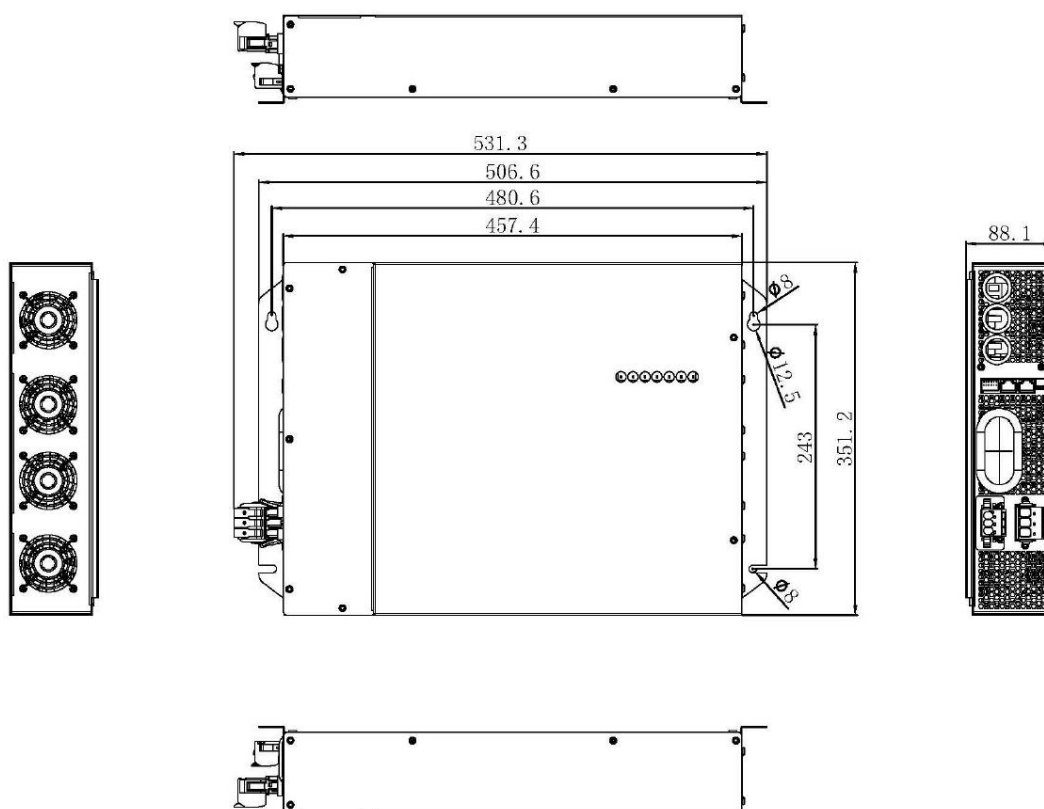


Fig 2-5 Dimensions of PG6.0S / PG8.0S

2.2.2 PG series LED Indicator

Tab 2- 2 Indicator of PG

LED	Color	Function
 Solar	Green	● Off: No solar input ● Slow flashing: Solar input detected but MPPT is not working ● ON: MPPT charger is working
 AC in	Green	● Off: No AC input ● Slow flashing: AC input detected but no charging or bypass power supply ● Fast flashing: Bypass power supply is working ● ON: AC charger is working
 DC/DC	Green	● OFF: Alternator is not working ● Slow flashing: Alternator input detected but DC/DC is not working ● Fast flashing: 48V battery is charging the starter battery or powering the loads. ● ON: 12V alternator is charging the 48V battery
 Inverter	Green	● OFF: No battery voltage detected ● Slow flashing: Battery connected ● Fast flashing: Inverter power assist function is working. ● ON: Inverter is working
 Alarm	Yellow	● OFF: No warning ● Fast flashing: Warning active
 Fault	Red	● OFF: No fault ● Fast flashing: Fault present
 Insulation guard fault	Red	● OFF: In inverter mode, insulation guard is normal. ● ON: Insulation guard is abnormal, and the inverter stops the output.

*Slow flashing is on for 0.5 seconds and off for 1.5 seconds in a loop.

*Fast flashing is on for 0.5 seconds and off for 0.5 seconds in a loop.

2.2.3 Terminal Overview

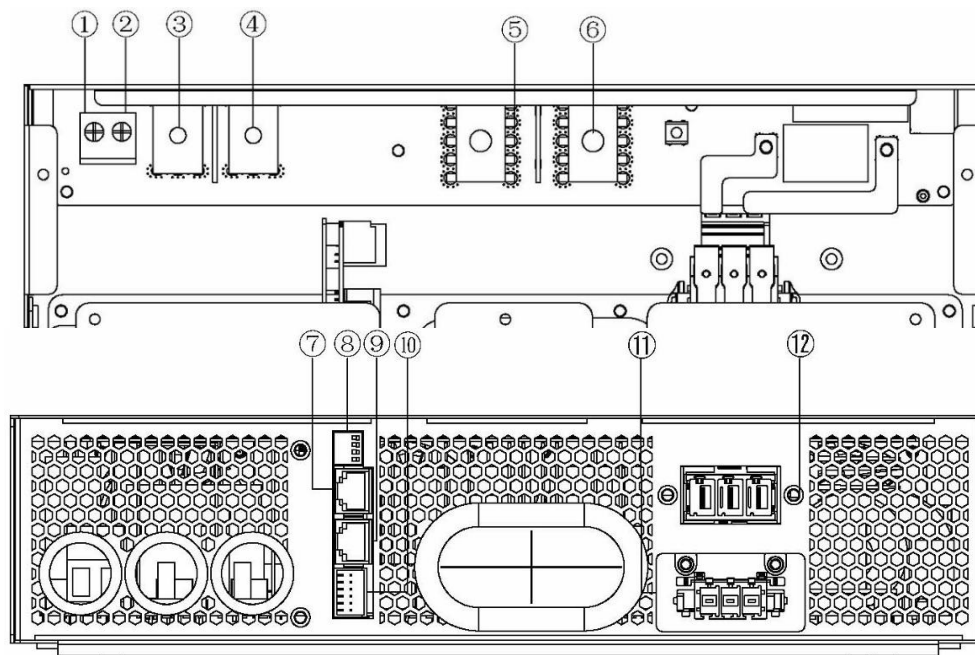


Fig 2- 6 Terminal Overview of PG4.0S

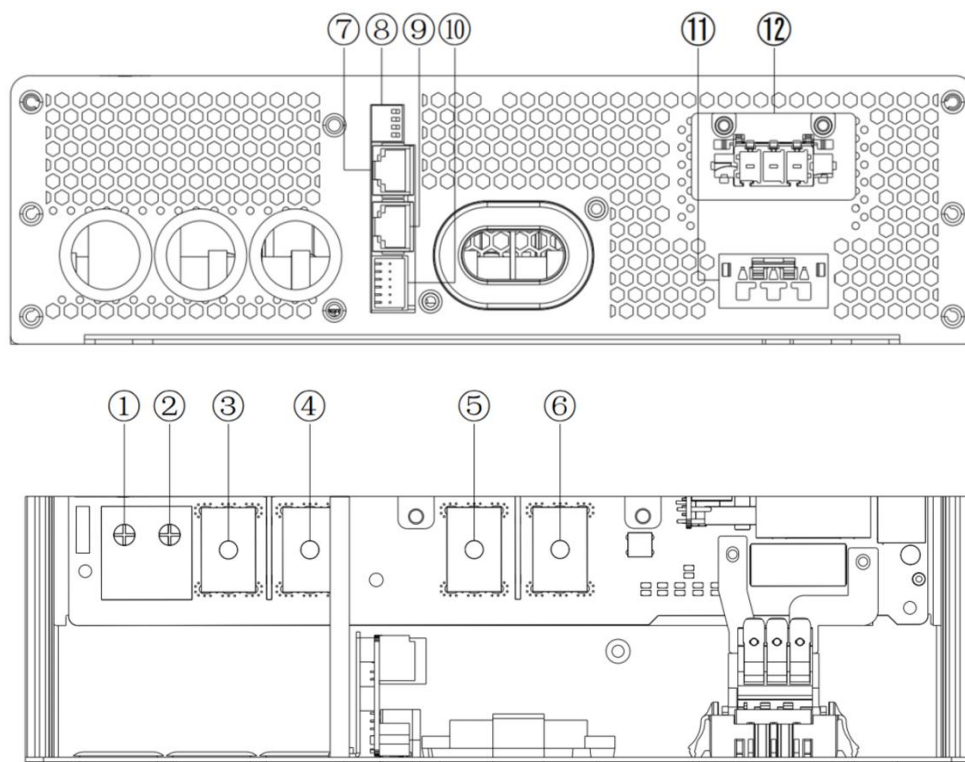
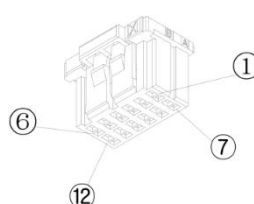


Fig 2- 7 Terminal Overview of PG6.0S / PG8.0S

Tab 2- 3 Terminal Description

No	Terminal	Description
①	PV+	Solar panel positive port
②	PV-	Solar panel negative port
③	ALT+	ALT positive port
④	ALT-	ALT negative port
⑤	BAT-	Auxiliary battery negative port
⑥	BAT+	Auxiliary battery positive port
⑦	CAN	CAN port for communication
⑧		DIP switch
⑨	Display	For display connection
⑩	COM	COM port
⑪	AC IN	PG4.0S: AC input port, WAGO 770-713 PG6.0S/PG8.0S: AC input port, WAGO 831-3203 L: Live wire, PE: Ground wire, N: Neutral wire
⑫	AC OUT	PG4.0S: AC output port, WAGO 831-3203 PG6.0S/PG8.0S: AC output port, WAGO 832-1203 L: Live wire, PE: Ground wire, N: Neutral wire

Tab 2- 4 COM Cable Pin Definition

Port	PIN		Definition	
COM	1	Connector type: WD2500-2H06B001 W 	Starter battery voltage sampling+	
	2		Starter battery voltage sampling-	
	3		Isolation power supply +12V_ISO	
	4		Isolation power supply 0V_ISO	
	5		CAN_L	
	6		CAN_H	
	7		D+ signal input	
	8		System On/Off Switch, for remote switch or dry contact output	
	9			
	10		Relay_NC, dry contact output, normally close	28V DC/ 3A
	11		Relay_NO, dry contact output, normally open	
	12		Relay_COM, dry contact output, common point	

2.3 DYN43 Display

The DYN43 is a 4.3-inch high-definition touchscreen monitor. The power switch serves as the main control for the connected device, while the two touch buttons can be preset to control various system functions (e.g., inverter on/off) within the TBB system. The monitor features built-in Bluetooth connectivity. After pairing with the mobile APP, users can view system information, configure software parameters, and perform Bluetooth OTA firmware upgrades. For some special scenarios, the Bluetooth function can also be disabled through the screen's software settings.

2.3.1 Product Overview & Dimensions



Fig 2- 8 DYN43

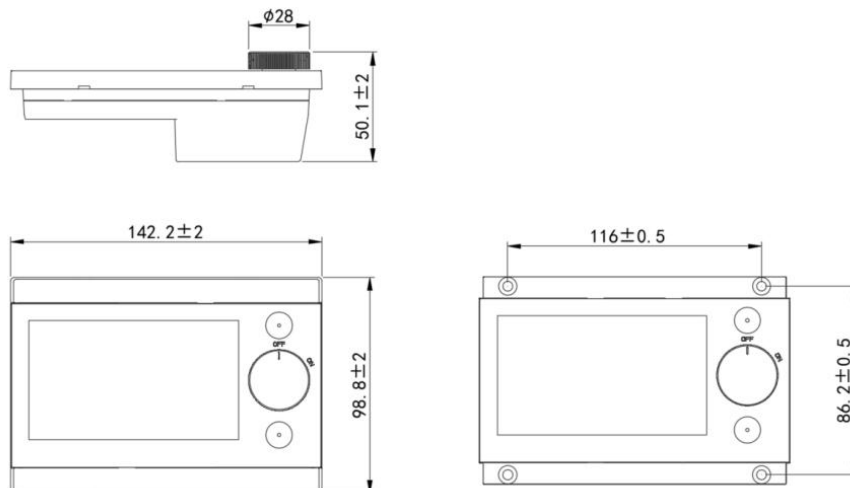


Fig 2- 9 Dimensions of DYN43

2.3.2 Operating Instructions

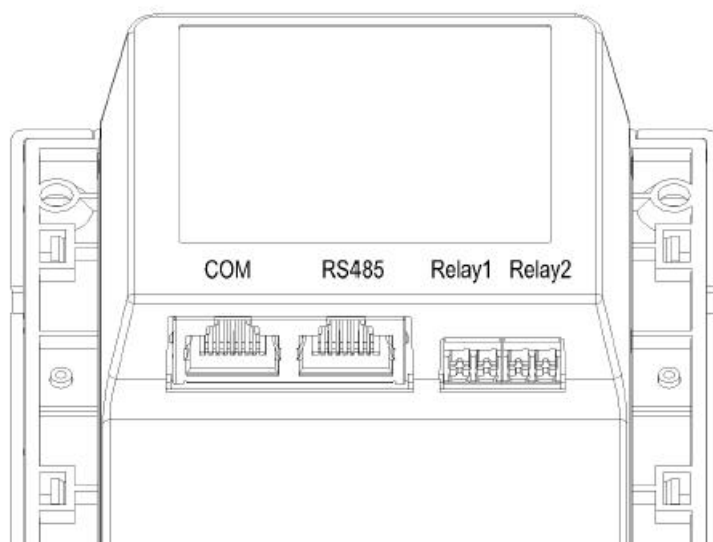


Fig 2- 10 Terminal of DYN43

Tab 2- 5 Dry Contact Cable Pin Definition

Port	No.	Definition	Comments
Relay1	Pin 1	Relay1 COM	
	Pin 2	Relay1 NO	
Relay2	Pin 3	Relay2 COM	
	Pin 4	Relay2 NO	

2.4 M48 Series Battery

2.4.1 M48-105



Fig 2- 11 M48-105

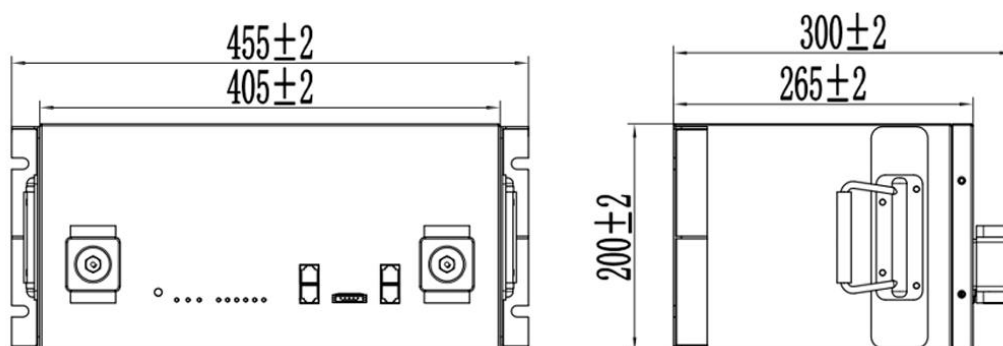


Fig 2- 13 Dimensions of M48-105 Battery

2.4.2 M48-150



Fig 2- 12 M48-150

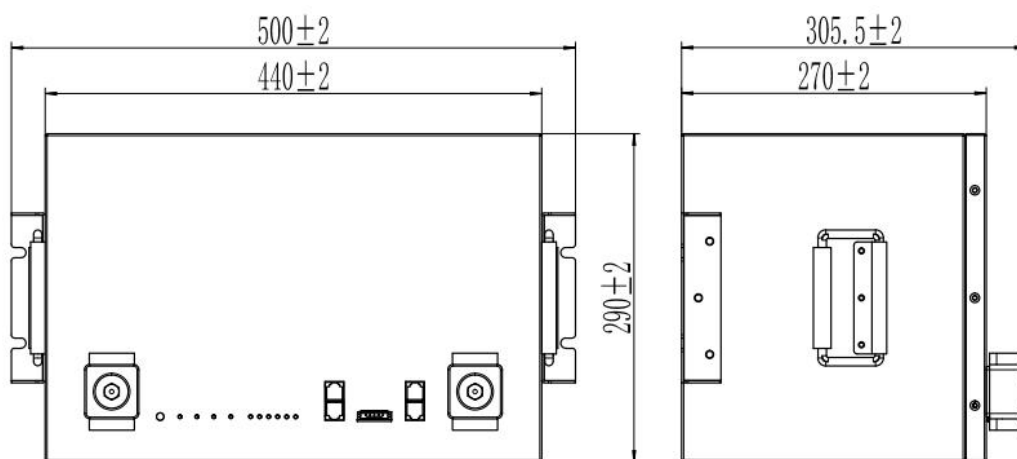
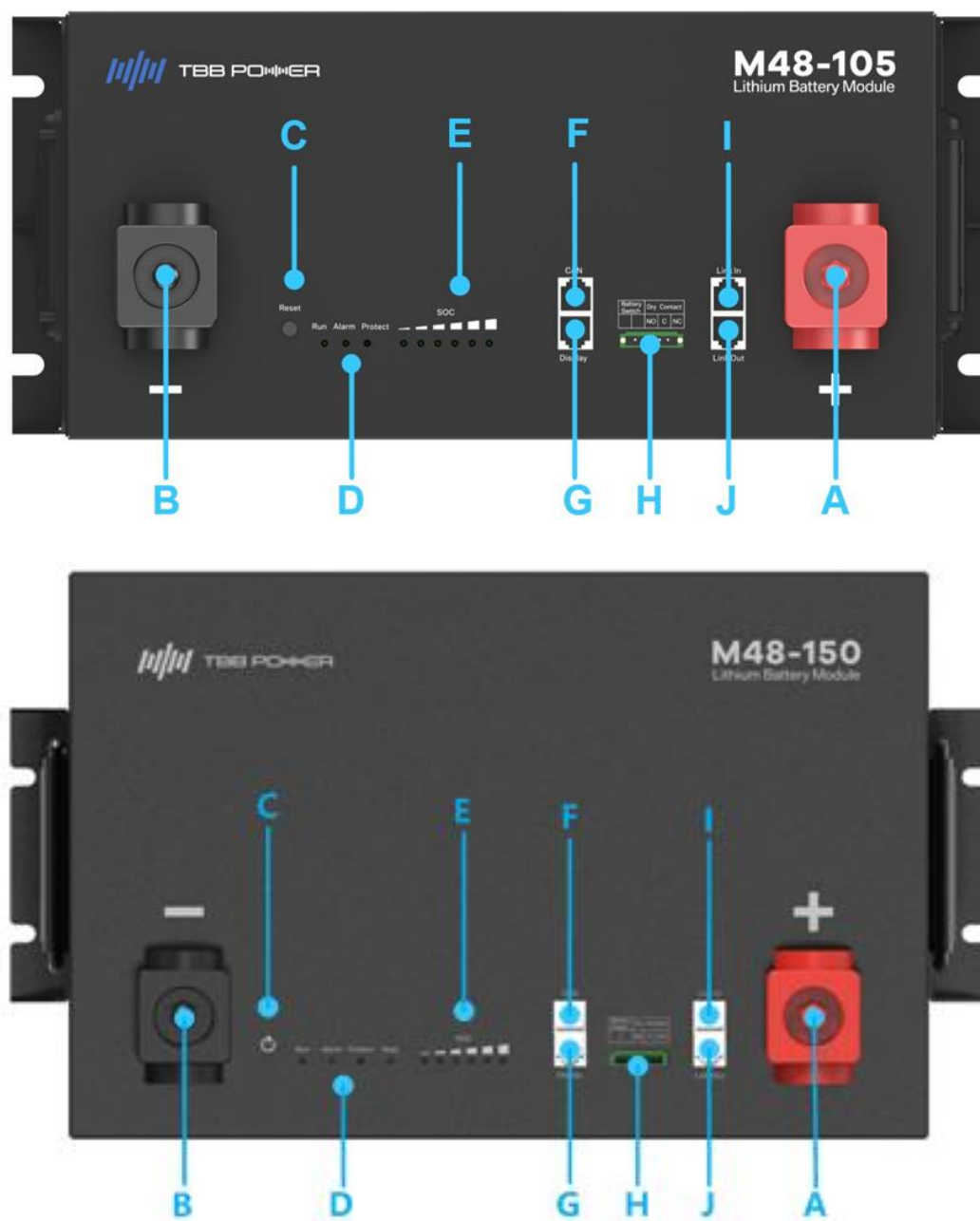


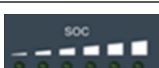
Fig 2- 14 Dimensions of M48-150 Battery

2.4.3 Terminal Overview



Tab 2- 15 Terminal Description of M48 Battery

No.	Silk Screen	Name	Description
A	+	Positive terminal	Battery output positive or parallel positive, M8
B	-	Negative terminal	Battery output negative or parallel negative, M8

C	Reset 	Reset key or forced shutdown	1.Address allocation reset button:When connecting batteries in parallel for the first time or replacing a battery, press and hold the reset button for at least 2 seconds after the master! battery has started up. 2. Emergency power off: When the battery is in standalone mode, press and hold the forced shutdown button for more than 10 seconds to forcibly turn off the output and power down the battery.
D	Run	Running indicator	Green indicator. Steady on: Charging Flashing: Discharge mode or Charge Only
	Alarm	Alarm indicator	Yellow indicator. Flashing: Warning status. The warning is generally cleared automatically after the triggering condition is removed.
	Protect	Protection indicator	Red indicator. Flashing: Protection status. The protection is generally cleared automatically after the triggering condition is removed.
	Heat (Only M48-150)	Heater indicator	Green light, flashing when requesting heating constantly on during heating process, otherwise off.
E		SOC indicator	The number of green lights shows the remaining battery power.
F	CAN	External communication port	External communication port, support CAN communication.
G	Display	Monitor or display port	Connects to a remote switch or DYN43 display panel.
H	Battery Switch		Remote switch interface, connect to Battery Switch to remotely switch ON/OFF the lithium battery.
	Dry Contact	NO	Relay output normally open contact.
		C	Relay output common end.
		NC	Relay output normally closed contact.
I	Link In	Parallel communication interface	Connect to the Link Out of the previous battery.
J	Link Out		Connect to the Link In of the next battery.

3 System Installation Requirements

3.1 Distribution Compartment Requirement

3.1.1 Heat Dissipation In the Compartment

As shown in the figure below, ensure that the distribution compartment is equipped with 2 or more cooling fans (fan speed $\geq 2200\text{RPM}$), installed on the front, rear, left, or right side of the compartment. A minimum clearance of 200 mm must be maintained in front of each fan with no obstructions. The airflow configuration should consist of one intake and one exhaust, ensuring adequate ventilation and cooling for the modules inside the compartment.



Fig 3-1 Schematic Diagram of Heat Dissipation in Distribution Compartment

3.1.2 Water and Electricity Isolation

To prevent water leakage from water tanks, pipes, pumps, washing machines, or other water-using equipment from affecting the safe operation of the modules, ensure that all water-related equipment is effectively isolated from the distribution compartment. This helps maintain a dry and safe environment for the modules, wiring harnesses, and related components.

3.2 System Cables

3.2.1 Cable Size Recommendations

AC cables and DC cables are configured by the users themselves. To ensure the electrical safety, cable diameter must be selected in strict accordance with the system

power cable wiring diagram or refer to the following table:

Table 3-1 System Power Cable Recommendations

Equipment name	Cable Size	Cable Length
PG Series-PV	10~16mm ²	<3m
PG Series-ALT	35~50mm ²	<3m
PG-BAT	PG4.0S: 35~50mm ² PG6.0S / PG8.0S: 50~75mm ²	<3m
PG-AC Input	PG4.0S: 3~6mm ² PG6.0S / PG8.0S: 6~10mm ²	<3m
PG-AC Output	PG4.0S: 6~8mm ² PG6.0S / PG8.0S: 10~16mm ²	<3m



NOTE:

- 1) To prevent fire and electric shock, ensure that all cables have electrical ratings and sufficient cross-sectional area.
- 2) The use of damaged cables or cables with insufficient cross-sectional area is strictly prohibited.
- 3) Cables with a temperature resistance of 105° C must be selected.

3.2.2 Cable Colors

To ensure standardized wiring and easy identification of connections, the following color coding is recommended:

DC side: red wires for the positive pole and black wires for the negative pole.

AC side: blue wires for the neutral conductor, red or brown wires for the line conductor.

Protective earth: yellow-green wires.

3.2.3 Wiring Requirements

- 1) To prevent the charger from being energized during wiring, which may cause arcing or ignition, ensure that the switch of each module and external control signals, the switch of each battery, and the big gate on the output side are all in the state of disconnection. Live operation is strictly prohibited.

- 2) To prevent incorrect connections or missing cables, strictly follow the system wiring diagram during installation.
- 3) Ensure that DC input polarity is correct, otherwise, the module will be damaged. Ensure that the AC input and output cables are connected correctly; incorrect wiring may damage the inverter.
- 4) To ensure proper heat dissipation and reliable electrical contact, make sure that all terminals are securely crimped and all cables are firmly connected.
- 5) Only one cable terminal is permitted in each terminal hole. Do not connect more than one cable to the same terminal.
- 6) Install each module as close as possible to the battery fuse box to minimize cable length and reduce voltage drop and power loss.
- 7) Ensure that the battery negative terminal, inverter chassis grounding connection, and AC input/output protective earth conductors are properly and reliably connected.

3.2.4 Wiring Rules

- 1) To ensure long-term stable operation, power cables, signal cables, and network cables shall be routed through dedicated cable channels. Ensure that there are no sharp objects along the routing path to prevent damage to the cables.
- 2) Allow sufficient slack at terminal connections, especially near cable terminals and communication connectors—to prevent excessive tension or sharp bending.
- 3) The minimum permissible bending radius shall be:
 - $\geq 4D$ for cables with an outer diameter less than 25 mm
 - $\geq 6D$ for cables with an outer diameter 25 mm or greater

(Note: D refers to the outer diameter of the cable.)

- 4) To reduce signal interference, separate wiring between the signal harness and power lines.
- 5) Ensure that cables are not compressed by any module. Cable routing shall avoid sharp edges and shall not be placed too close to modules, to prevent overheating and mechanical damage.

3.3 Fuse Recommendations

To ensure the independence of each module input and system safety, each module input must be protected by an individual fuse. Fuse specifications shall be selected in strict accordance with the system power wiring diagram or the following table:

Table 3-2 Positive Input Fuse Specification Configuration Recommendations

Equipment Name	Positive Fuse Specifications
PG 3.0S / 4.0S / 6.0S / 8.0S to Starter Battery	200A, 80V, flat type fuse



NOTE:

- 1) It is recommended to use fuses with ceramic bodies or other materials with good heat dissipation performance.
- 2) Each module must be equipped with its own fuse. Sharing a fuse between modules is strictly prohibited.

3.4 PV Panel Configuration Requirements

To ensure normal PV charging and normal and safe operation of the inverter, the following requirements must be strictly observed when configuring the PV panel:

- 1) The configured PV voltage value must be within the range of 15~60V.
- 2) The maximum PV input power shall not exceed 1800W.

3.5 Communication Address Setting

When multiple identical M Series batteries are used, each battery must be assigned a unique communication address to distinguish individual devices.



Fig 3-2 M Series Battery Parallel Interface Position

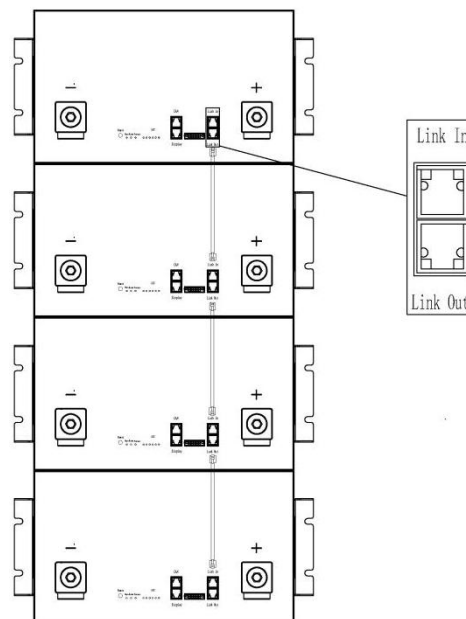


Fig 3-3 M Series Battery Communication Wiring Diagram

When connecting multiple M Series batteries in parallel, use standard UTP network cables and follow the wiring diagram shown in the figure. Connect the batteries from Link Out to Link In. It is not necessary to form a closed loop between the first and last batteries.

When connecting M Series batteries in parallel for the first time, or when replacing a battery, press and hold the Reset button for at least 2 seconds after powering on the master battery to reset address allocation.

4 System Operation

4.1 Pre-Startup Inspection

- 1) Confirm that the battery circuit breaker is in the OFF position.
- 2) Check that all modules are securely installed and that the installation space meets the heat dissipation requirements.
- 3) Ensure that the actual input voltage of each module matches its rated operating voltage.
- 4) Confirm that the DC input polarity of each module is correct and no short circuits are present, as incorrect wiring may damage the modules.
- 5) Check that all signal cables are properly connected and securely fastened.
- 6) Ensure that power cables and signal cables are reliably connected.
- 7) Check that the DIP switch settings of each module are correctly configured.

4.2 System Power-up



WARNING: Double-check battery polarity and battery voltage before closing the battery circuit breaker.

- 1) Turn each lithium battery switch to ON.
- 2) Close the battery main switch (if installed on the battery output), Turn the battery switch knob to ON (as shown in the figure). After five seconds, the battery switch indicator light will illuminate, indicating that the battery output is active.



Fig 4-1 Battery Switch Knob

3) The system will enter the startup self-test process and then display the main page.

4) After the system powers on, the PG will automatically initiate DC-DC operation.

4.3 System Shutdown

Turn the battery switch knob to OFF. After three seconds, the indicator light will turn off, the battery output will stop, and the system will shut down.

4.4 Inverter ON/OFF

When the system is powered on, the inverter is on by default.

To turn it off, touch the inverter switch button once (highlighted area).

When the inverter is off, touch the inverter switch button once to turn it on.



Fig 4-2 Inverter Switch Button

4.5 Automatic Charging Function

When both the system and battery are powered off, the presence of mains power, alternator charging, or sufficient PV input will automatically wake up the PG and initiate battery charging, while simultaneously powering on the DYN43 display. Once the respective charging source is disconnected or charging conditions are no longer met, the PG will stop charging, the battery will shut down, and the system will automatically return to the powered-off state.

5 Display Operating Instructions

5.1 Description of DYN43 Interface Display

5.1.1 Home Page - Bluetooth

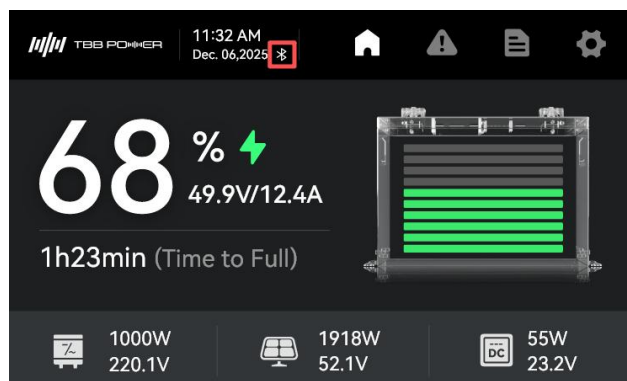


Fig 5-1 Home Page - Bluetooth

On the right side of the main interface time display area, the Bluetooth status indicator is shown. If Bluetooth is not connected, the icon appears grayed out. Tapping the Bluetooth icon at the top of the screen opens a pop-up window displaying the Bluetooth device name and pairing code for mobile phone connection.

The “TBB Connection” app can be downloaded by scanning the QR code below or by searching for "TBB Connection" in the Apple Store or Google Play.



Apple Store / Google Play

For detailed APP functions, please refer to "UNIDYNGO APP User Guide_A1.0.pdf".

5.1.2 Home Page - Battery

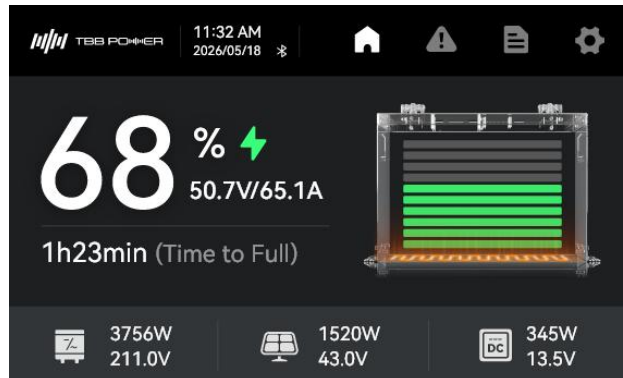


Fig 5-2 Home Page - Battery

- 1) The system displays the current battery status (charging or discharging).
 - When the battery is charging, the main page shows the remaining charging time.
 - When the battery is discharging, the main page shows the remaining discharging time.
- 2) Tap the battery sign on the home page to enter the Battery Bank page.

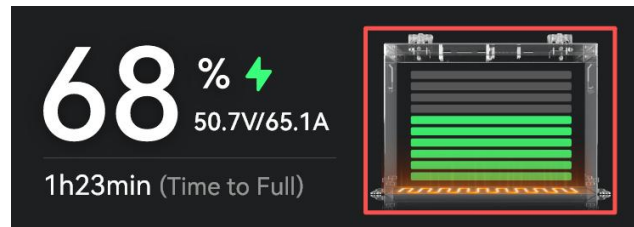


Fig 5-3 Home Page - Battery Area

The page details are as follows:

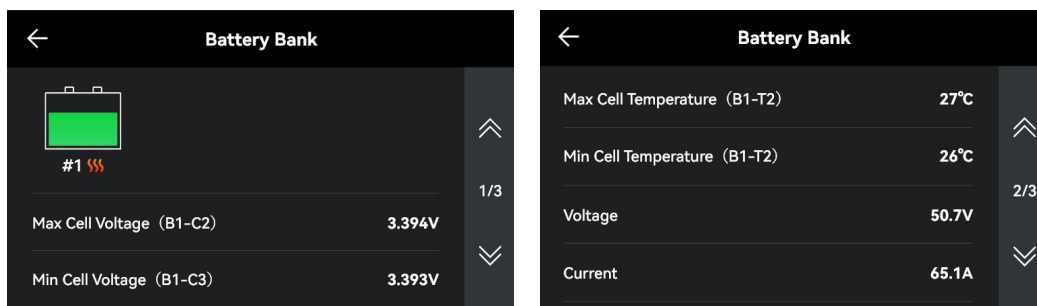


Fig 5-4 Battery Bank Page

5.1.3 Home Page - Charger

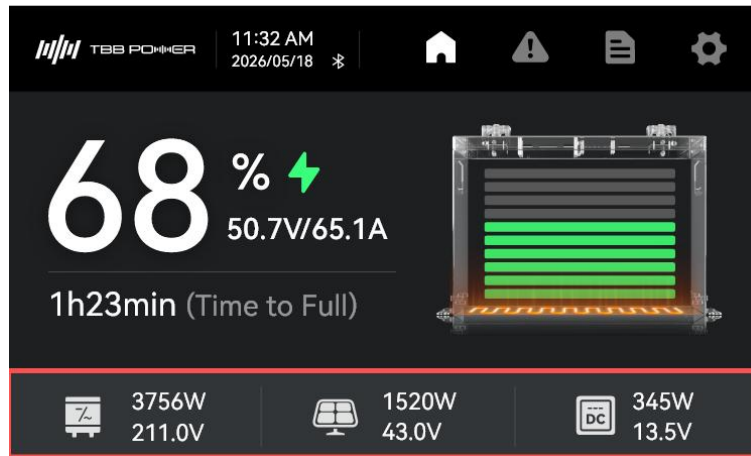


Fig 5-5 Home Page - Charger

At the bottom of the home page, the following values are displayed:

- Inverter output current
- Solar charging current
- Alternator charging current

(When multiple devices are connected, the displayed value is the sum of all devices.)

When the charger is not operating or disconnected, the data shows "--", while the unit remains displayed, as shown in the figure below.



Fig 5-6 Home Page - Charger

1) Tap "Inverter" to enter the inverter charger detail page.

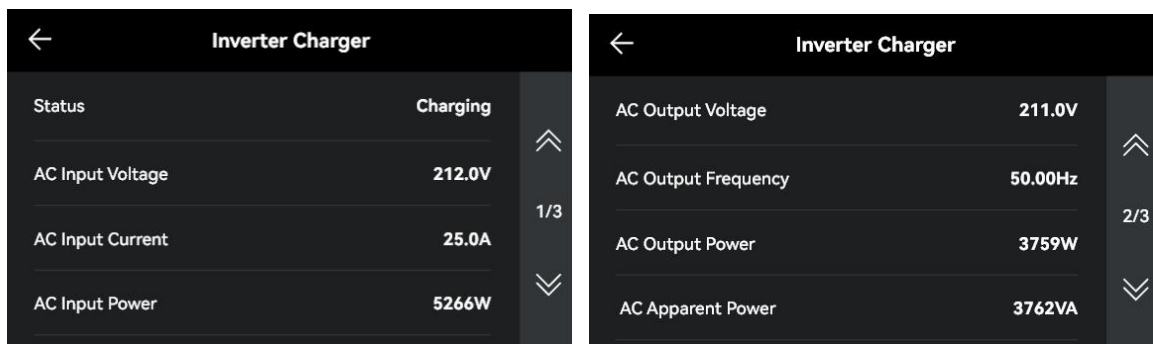


Fig 5-7 Home Page - Charger-Inverter

2) Tap “Solar” to enter the solar charger detail page.

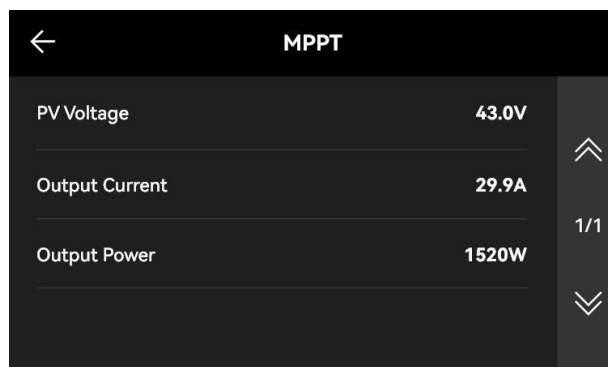


Fig 5-8 Home Page - Charger - Solar

3) Tap “Alternator” to enter the ALT charger detail page.

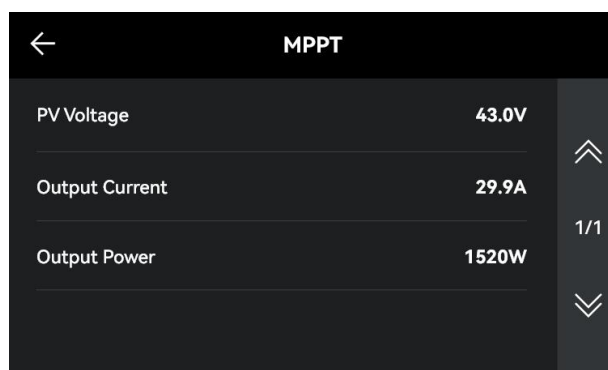


Fig 5-9 Home Page - Charger - Alternator

5.1.4 Home - Header Bar

The header bar displays the TBB Logo, Bluetooth status, Home page, Alarm page, Software Details page and Settings page from left to right.

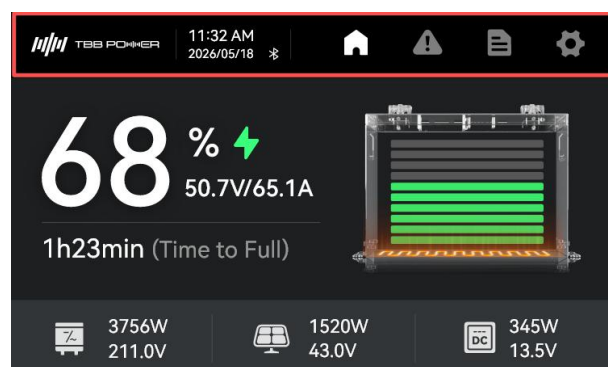


Fig 5-10 Home Page - Header Bar

5.2 Warning Page

The system can display current alarm information.

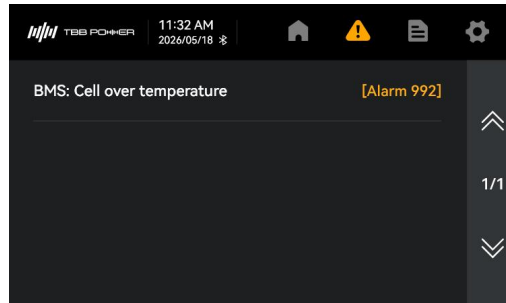


Fig 5-11 Alarm Page - Alarm Message

Note: Refer to the Troubleshooting for the complete fault and alarm list.

5.3 Information Page

The system also displays the model number, software version, and other relevant information for each module.

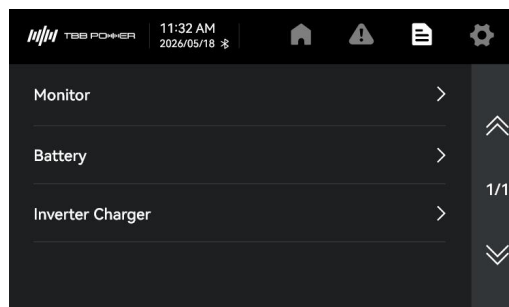


Fig 5-12 Information Page

5.4 Setup Page

All system modules can be configured via the Settings page.

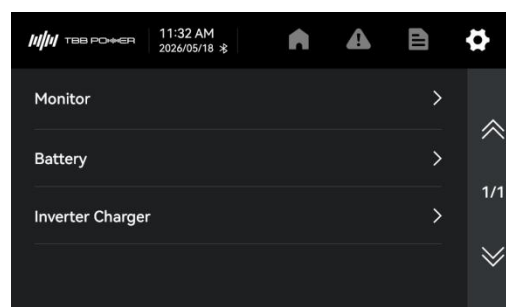


Fig 5-13 Settings Page

5.4.1 Monitor Settings Page

The monitor settings include Date Format, Date, Time Format, Time, Brightness, Bluetooth Mode, Auto Screen Off Time, Buzzer Mode, and Restore Default Parameters.

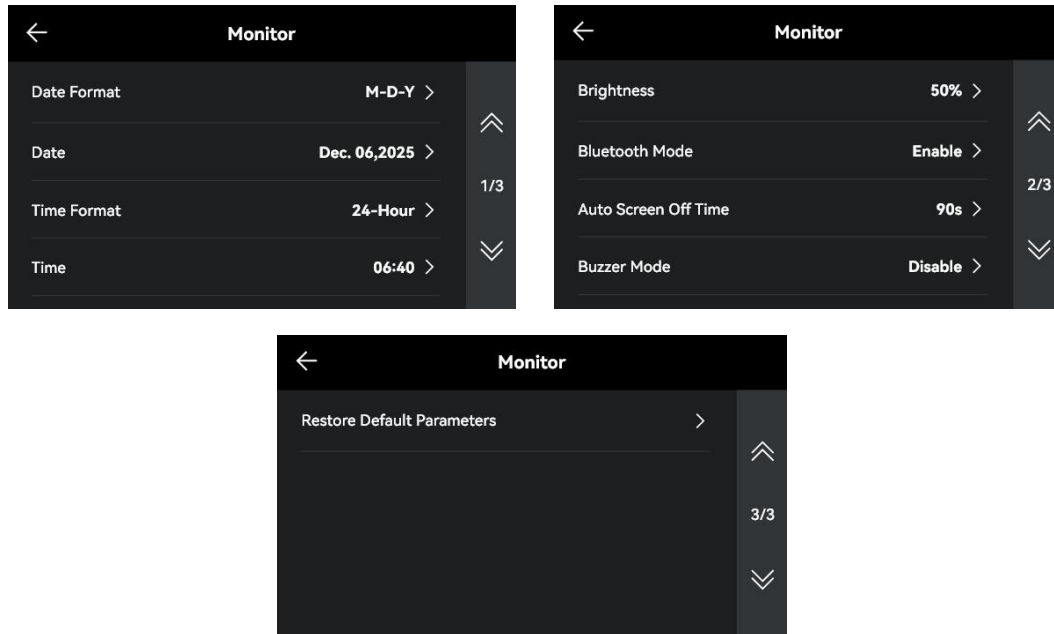


Fig 5-14 Settings Page - Monitor Settings

Table 5-1 Monitor Settings Allows for Parameter Settings

Settings	Options	Notes
Date Format	Y-M-D / M-D-Y / D-M-Y	Set the system date format
Date	YYYY-MM-DD	Set the system date
Time Format	12-hour / 24-hour	Set the system time format
Time	00:00~23:59	Set the system time
Brightness	0~100%	Set the screen brightness
Bluetooth Mode	Enable / Disable	Turn Bluetooth on or off.
Auto Screen Off Time	30s / 60s / 90s / Never	Set the screen timeout.
Buzzer Mode	Disable / Single Alarm / Interactive Alarm	Set the buzzer alarm mode: Disable: Buzzer disabled.; Single Alarm: Five warning beeps; Interactive Alarm: Tap the screen

Settings	Options	Notes
		to stop the buzzer.
Restore Default Parameters	Click to set	Restore all display settings to default.

5.4.2 Battery Settings Page

The battery settings include Dry Contact Mode, Dry SoC Trigger Value, Dry SoC Recover Value, and Parallel reinitialization.

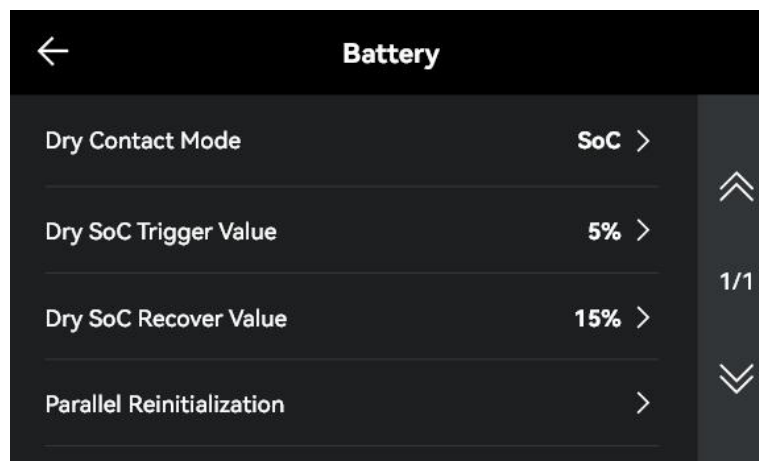


Fig 5-15 Settings Page - Battery Settings

Table 5-2 Battery Settings Allows for Parameter Settings

Settings	Options	Notes
Dry Contact Mode	Low Voltage / Over Temp / Over Current / SoC	Select the trigger condition for the dry contact output.
Dry SoC Trigger Value	1~50%	Available only when Dry Contact Mode is set to SoC.
Dry SoC Recover Value	(Dry SoC Trigger Value)+1%~ (Dry SoC Trigger Value)+50%	Available only when Dry Contact Mode is set to SoC.
Parallel Reinitialization	Click to set	Reinitialize Parallel System

5.4.3 Inverter Charger Settings Page

The inverter charger settings include AC Input Source, Shore Power Current Limit, and Inverter Work Mode.

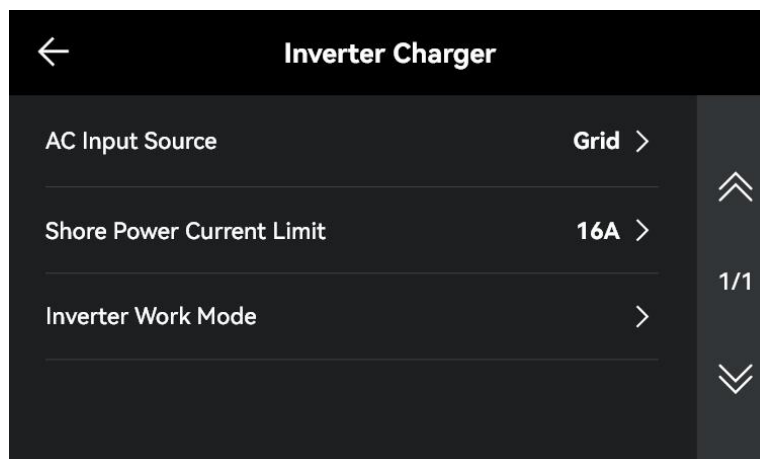


Fig 5-16 Settings Page - Inverter Charger

Table 5-3 Inverter Charger Settings Allows for Parameter Settings

Settings	Options	Notes
AC Input Source	Grid / Generator*	Default: Grid Generator can be applied in weak power grids and can enhance the compatibility of power grid fluctuations.
Shore Power Current Limit	5~25A*	Set the AC input current limit The setting range varies by model.
Inverter Work Mode	Full Power / Silent Mode (Fan Off) / Quiet Mode (Min Fan)	Select the inverter work mode to balance power output and fan noise.

6 System Software Upgrade

6.1 OTA Firmware Upgrade via TBB Connection App

The UNIDYNGO system supports OTA firmware upgrades for system components via the TBB Connection App.

When a new firmware version becomes available, an update notification will appear in the Firmware Version section. Simply tap the new version entry to initiate the corresponding update process.

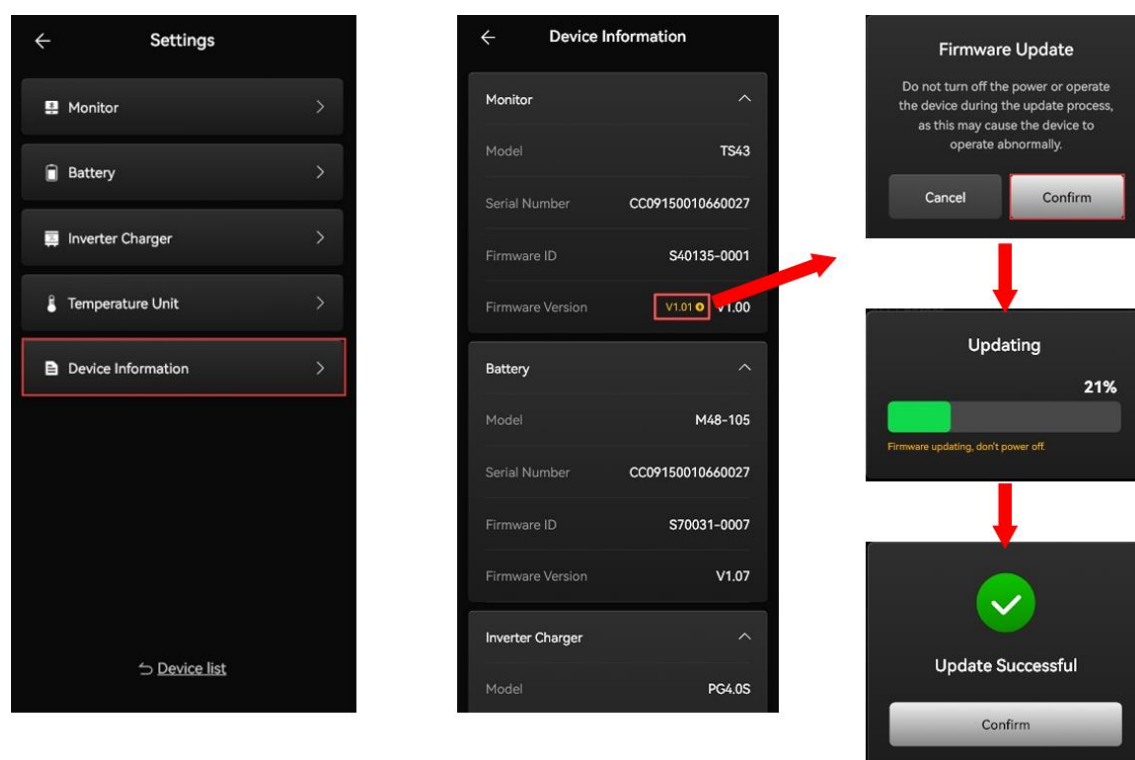


Fig 6- 1 Software Upgrade Guide

6.2 Software Upgrade Precautions

During the system firmware upgrade process, please observe the following important guidelines to ensure a successful and safe update:

- **Battery Upgrade – Load Condition**: When upgrading battery firmware, ensure the battery is under no-load or light-load conditions. A current draw of < 10 A is recommended.

Note: The battery will experience a brief power interruption during the upgrade

process; please ensure no critical or non-interruptible loads are connected.

- **Battery Upgrade – SoC:** Before initiating a battery firmware upgrade, verify that the battery has sufficient charge. A SoC of $\geq 15\%$ is recommended to prevent power loss during the flashing process.
- **Inverter Upgrade – Load Condition:** When upgrading inverter firmware, ensure the inverter is not supplying power to critical or non-interruptible loads. The inverter output will stop during the upgrade process.
- **Equipment Stability During Flashing:** During the firmware flashing process, do not move or vibrate the equipment, as physical disturbance may cause communication interruptions and result in upgrade failure.
- **Power Supply During Flashing:** During the firmware flashing process, do not disconnect or turn off the battery power supply, as premature power loss may corrupt the firmware and render the device inoperable.
- **Handling Upgrade Interruptions:** If the firmware flashing process is interrupted, do not disconnect the DYN43 screen or other system devices from the communication network. The TBB system upgrade program features breakpoint resume capability; re-initiating the upgrade process can recover from interruptions and prevent permanent device damage caused by incomplete firmware installation.

7 System Connection

7.1 Wiring Diagram

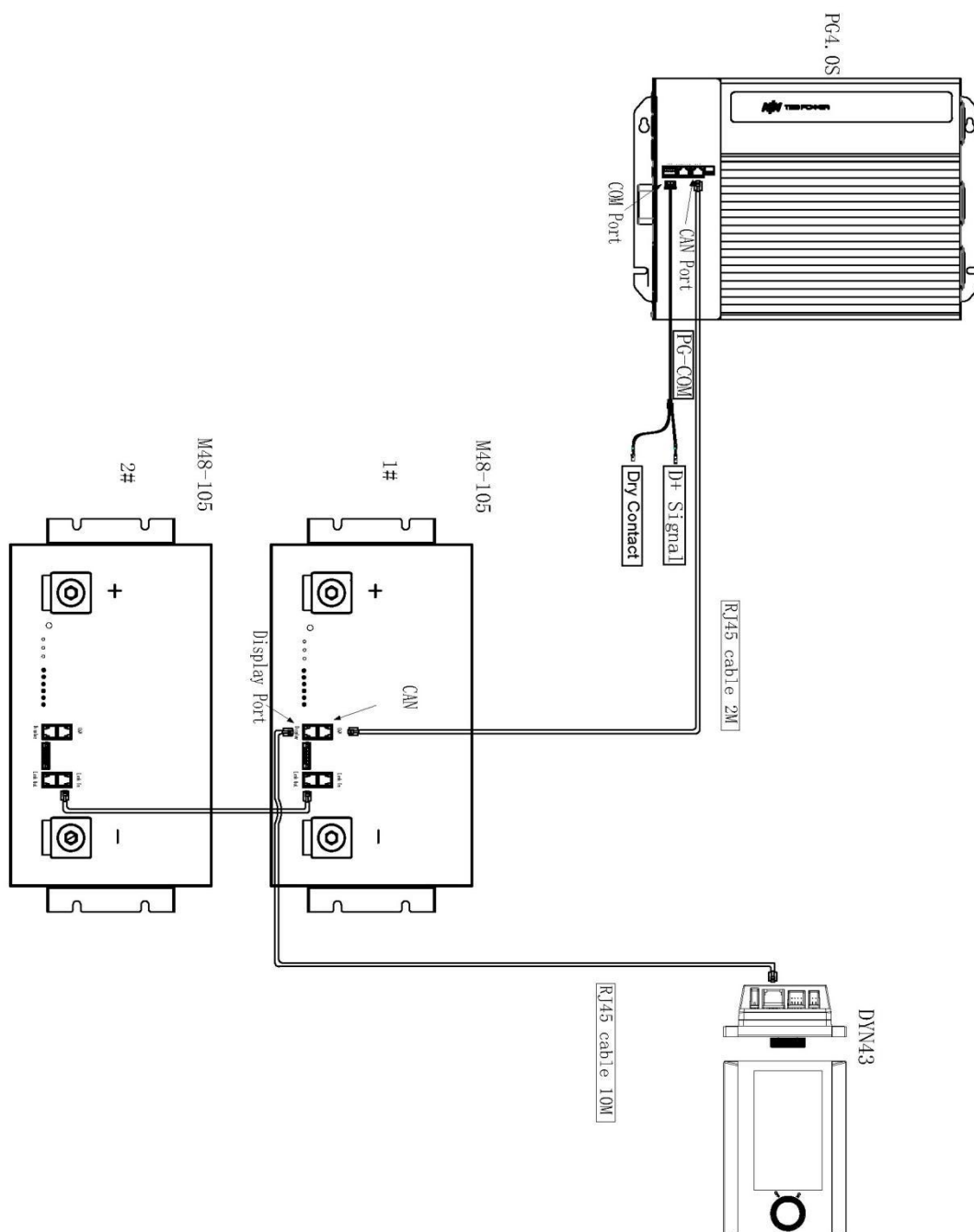


Fig 7-1 UNIDYNGO Communication Cable Connection

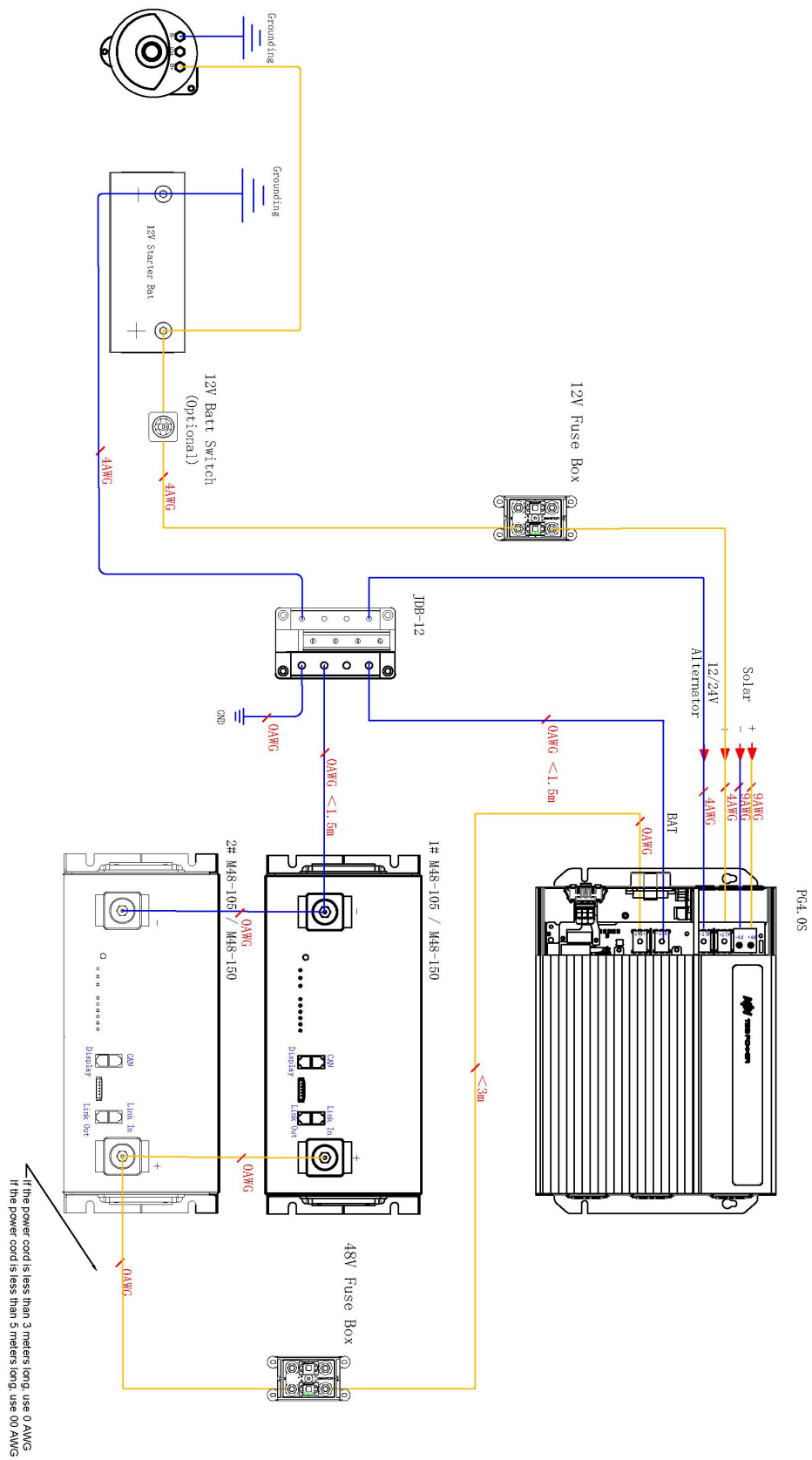


Fig 7-2 UNIDYNGO Power Cable Connection

8 Alarm List

8.1 DYN43 Alarm List

No.	Code	Error Message	Suggestion
1	ALM 541	TS43: Battery communication loss [ALM 541]	1. Check the inverter power supply and communication cable connection. 2. Restart the inverter or the entire power system. 3. If the issue persists, contact your distributor.
2	ALM 501	TS43: Inverter communication loss [ALM 501]	1. Check the battery power supply and communication cable connection. 2. Restart the battery or the entire power system. 3. If the issue persists, contact your distributor.

8.2 BMS Alarm List

No.	Code	Error Message	Suggestion
1	ERR 400	BMS: Cell or module over voltage [ERR 400]	1. Check whether the charger's charging voltage matches the lithium battery specifications. 2. Check whether the charger is operating normally. 3. If the issue persists, turn OFF the charger and contact your distributor.
2	ERR 401	BMS: Cell or module under voltage [ERR 401]	Battery voltage is low. Charge the battery as soon as possible.
3	ERR 402	BMS: Cell over temperature [ERR 402]	1. Check whether the ambient temperature at the battery installation location is too high. 2. Check whether the battery wiring is secure and reliable. 3. Check whether the cable size meets the requirements specified in the manual. 4. Check whether the discharge current or discharge duration

No.	Code	Error Message	Suggestion
			exceeds the specified limits (see the technical specifications for details). 5. If the issue persists, contact your distributor.
4	ERR 403	BMS: Cell under temperature [ERR 403]	1. Check whether the ambient temperature is too low. 2. If the issue persists, contact your distributor.
5	ERR 404	BMS: Discharge over current [ERR 404]	1. Check whether the battery discharge current exceeds the rated discharge current. If so, reduce part of the load. 2. If the issue persists, contact your distributor.
6	ERR 405	BMS: Charge over current [ERR 405]	1. Check whether the charger's charging current matches the lithium battery specifications. 2. If the issue persists, contact your distributor.
7	ERR 406	BMS: System error [ERR 406]	Restart the battery. If the issue persists, contact your distributor.
8	ERR 420	BMS: Load pre-charge time out [ERR 420]	1. Check whether there is a reverse connection or short circuit at the battery output side. 2. Reduce the load appropriately and restart the battery. 3. If the issue persists, contact your distributor.
9	ERR 407	BMS: Outside over voltage [ERR 407]	1. Check whether the charger's charging voltage matches the lithium battery specifications. 2. Check whether the charger is operating normally. 3. If the issue persists, turn OFF the charger and contact your distributor.
10	ERR 408	BMS: BMS over temperature [ERR 408]	1. Check whether the ambient temperature at the battery installation location is too high. 2. Check whether the battery wiring is secure and reliable. 3. Check whether the cable size meets the requirements specified in

No.	Code	Error Message	Suggestion
			the manual. 4. Check whether the discharge current or discharge duration exceeds the specified limits (see the technical specifications for details). 5. If the issue persists, contact your distributor.
11	ALM 409	BMS: Cell or module high voltage [ALM 409]	1. Check whether the charger's charging voltage matches the lithium battery. 2. Check whether the charger is operating normally. 3. If the issue persists, turn OFF the charger and contact your distributor.
12	ALM 410	BMS: Cell or module Low voltage [ALM 410]	Battery voltage is low. Charge the battery as soon as possible.
13	ALM 411	BMS: Cell high temperature [ALM 411]	1. Check whether the ambient temperature at the battery installation location is too high. 2. Check whether the battery wiring is secure and reliable. 3. Check whether the cable size meets the requirements specified in the manual. 4. Check whether the discharge current or discharge duration exceeds the specified limits (see the technical specifications for details) 5. If the issue persists, contact your distributor..
14	ALM 412	BMS: Cell low temperature [ALM 412]	1. Check whether the ambient temperature is too low. 2. If the issue persists, contact your distributor.
15	ALM 413	BMS: Discharge high current [ALM 413]	1. Check whether the battery discharge current exceeds the rated discharge current. If so, reduce part of the load. 2. If the issue persists, contact your distributor.
16	ALM 414	BMS: Charge high current [ALM 414]	1. Check whether the charger's charging current matches the lithium

No.	Code	Error Message	Suggestion
			battery specifications. 2. If the issue persists, contact your distributor.
17	ALM 421	BMS: Heater fault [ALM 421]	Restart the battery. If the issue persists, contact your distributor.
18	ALM 415	BMS: Slave pack communication off-line [ALM 415]	1. Check whether the parallel communication cable is connected correctly. 2. Check whether the communication network cable is loose or damaged. Reconnect or replace the cable if necessary. 3. If the issue persists, contact your distributor.
19	ALM 417	BMS: Bat low voltage wait charge [ALM 417]	Battery voltage is low. Charge the battery as soon as possible.
20	ALM 418	BMS: Cell temperature is too high to charge [ALM 418]	1. Check whether the ambient temperature at the battery installation location is too high. 2. Check whether the battery wiring is secure and reliable. 3. Check whether the cable size meets the requirements specified in the manual. 4. Check whether the discharge current or discharge duration exceeds the specified limits (see the technical specifications for details) 5. If the issue persists, contact your distributor.
21	ALM 419	BMS: Cell temperature is too low to charge [ALM 419]	1. Check whether the ambient temperature is too low. 2. If the issue persists, contact your distributor.
22	ALM 416	BMS: BMS high temperature [ALM 416]	1. Check whether the ambient temperature at the battery installation location is too high. 2. Check whether the battery wiring is secure and reliable. 3. Check whether the cable size

No.	Code	Error Message	Suggestion
			meets the requirements specified in the manual. 4. Check whether the discharge current or discharge duration exceeds the specified limits (see the technical specifications for details) 5. If the issue persists, contact your distributor.

8.3 Inverter Charger Alarm List

No.	Code	Error Message	Suggestion
1	ALM 001	INV: 48V BAT low voltage [ALM 001]	Battery voltage is low. Charge the battery as soon as possible.
2	ALM 002	INV: Fan failure [ALM 002]	Fan is blocked or malfunctioning. Contact your distributor.
3	ALM 003	INV: Output overload alarm [ALM 003]	AC load exceeds rated power. Please reduce the load promptly.
4	ALM 004	INV: Device temperature is high [ALM 004]	1. Check whether the ambient temperature is too high. 2. Ensure adequate ventilation.
5	ALM 005	INV: Input voltage is high [ALM 005]	Check whether the AC input voltage is too high.
6	ALM 006	INV: Input over frequency [ALM 006]	Check whether the AC input voltage is too high.
7	ALM 007	INV: Input under frequency [ALM 007]	Check whether the AC input voltage is too high.
8	ALM 008	INV: GND wire disconnect [ALM 008]	1. Check the grounding connection. 2. If the grounding connection is normal, there may be an internal inverter fault. Contact the distributor.
9	ALM 009	INV: MPPT temperature is high [ALM 009]	1. Check whether ambient temperature is too high. 2. Ensure adequate ventilation.
10	ALM 010	INV: MPPT temperature is low [ALM 010]	1. Check if ambient temperature is too low. 2. If the issue persists, contact your distributor.

No.	Code	Error Message	Suggestion
11	ALM 011	INV: DCDC temperature is high [ALM 011]	1. Check whether the ambient temperature is too high. 2. Ensure adequate ventilation.
12	ALM 012	INV: DCDC temperature is low [ALM 012]	1. Check whether the ambient temperature is too low. 2. If the issue persists, contact your distributor.
13	ALM 013	INV: 12V output load is high [ALM 013]	Reduce DC 12V load.
14	ALM 014	INV: 12V output voltage is high [ALM 014]	Check the 12V DC output voltage and contact your distributor.
15	ALM 015	INV: PV input voltage is high [ALM 015]	Check whether the PV input voltage is too high.
16	ALM 016	INV: Communication fault [ALM 016]	Check the CAN communication connection and contact your distributor.
17	ERR 101	INV: Output short circuit [ERR 101]	Check whether the AC output is short-circuited.
18	ERR 102	INV: Output overload protection [ERR 102]	Check whether the AC output load exceeds the rated power.
19	ERR 103	INV: Output over current [ERR 103]	Check whether the AC output load exceeds the rated power.
20	ERR 104	INV: Interior over voltage [ERR 104]	Restart the device. If the issue persists, contact your distributor.
21	ERR 105	INV: MPPT over current [ERR 105]	Restart the device. If the issue persists, contact your distributor.
22	ERR 106	INV: MPPT hardware error [ERR 106]	Restart the device. If the issue persists, contact your distributor.
23	ERR 107	INV: DCDC over current [ERR 107]	Restart the device. If the issue persists, contact your distributor.
24	ERR 108	INV: DCDC hardware error [ERR 108]	Restart the device. If the issue persists, contact your distributor.
25	ERR 109	INV: 48V BAT under voltage [ERR 109]	Battery voltage is low. Charge the battery as soon as possible.
26	ERR 110	INV: 48V BAT over voltage [ERR 110]	1. Check whether the battery voltage is too high. 2. If the issue occurs frequently, contact your distributor.

No.	Code	Error Message	Suggestion
27	ERR 111	INV: PSU error [ERR 111]	Restart the device. If the issue persists, contact your distributor.
28	ERR 112	INV: ROM error [ERR 112]	Restart the device. If the issue persists, contact your distributor.
29	ERR 113	INV: Device over temperature [ERR 113]	1. Check whether the ambient temperature is too high. 2. Ensure adequate ventilation.
30	ERR 114	INV: Device under temperature [ERR 114]	1. Check whether ambient temperature is too low. 2. If the issue occurs frequently, contact your distributor.
31	ERR 115	INV: Interior sensor error [ERR 115]	Restart the device. If the issue persists, contact your distributor.
32	ERR 116	INV: Interior hardware error [ERR 116]	Restart the device. If the issue persists, contact your distributor.